Food Analysis

Public Health Apprentice Course

Overview

- Reasons for Food Analysis
- Public Health Analysis Abilities
  - Sensory Analysis of Foods
  - pH Analysis of Foods
- Sending the Rest to the Lab
  - Fundamentals of microbiological analysis
  - Collecting, Preparing, and Submitting Food Samples
- Recommendations Based on Analysis

Reasons for Food Analysis

- Why would we sample foods?
  - Foodborne illness investigations
  - Problems (safety or quality) noted with foods during:
    - Surveillance inspections
    - Special surveillance inspections
      - Food recalls
      - Food complaints
    - Receipt inspections
  - Sometimes done to check for contract specification compliance (quality assurance)

Public Health Analysis Abilities

- Sensory Analysis: *Organoleptic* sampling (organoleptic means “perceived by a sensory organ”)
  - Senses used for organoleptic sampling:
    - **Sight**--example?
    - **Smell**--example?
    - **Taste**--example?
    - **Sound**--example?
    - **Touch**--example?
  - Note: Tasting is never done if there is a concern for the safety of the food. Organoleptic sampling is mainly done to determine quality. Food can appear good using all the senses, but STILL contain pathogens/toxins. Poor quality food might indicate a food that has been abused and is perhaps more likely to contain pathogens.

Public Health Analysis Abilities (cont.)

- pH Analysis
  - Remember the microbial pH requirements?
    - What pH inhibits pathogen growth?
    - What microbes can grow at less than that pH
  - Easy for local Public Health to test pH
    - pH test strips (inexpensive)
    - pH meters (more expensive, but some offices may have these)

the ability to test it, then use the DoD Veterinary Laboratory

- Reference: DoD Veterinary Laboratory Sample Submission Guide
  - Three DoD Vet Labs
    - San Antonio (Ft Sam Houston)--Main Lab
    - Germany
    - Hawaii
  - Guide available on USAFSAM web page
  - Many microbiology and chemistry tests available

Using the DoD Veterinary Laboratory

- Microbiology
  - **Culturing bacteria out of food requires special techniques at the lab (more difficult than culturing blood or water)**

Have to put solid foods in a blender with sterile water to make a liquid so it can be put

Using the DoD Veterinary Laboratory

- Microbiology tests
  - The lab can test for specific pathogens and toxins
  - Plate Counts
    - Total (TPC) or Aerobic (APC)
      - Mainly measures of microbial quality
      - Poor correlation between plate counts and pathogen presence (a lot of spoilage organism growth)
    - Fecal coliform (e.g., *E. coli*) counts are better indicators of poor food plant sanitation

Using the DoD Veterinary Laboratory

- Chemistry tests:
  - Water activity
    - Remember what A_w is important to inhibit pathogen growth?)
  - Phosphatase
    - A test that can help determine if milk has been adequately heated during pasteurization
  - Heavy metals (e.g. lead)
  - Many quality assurance tests

Using the DoD Veterinary Laboratory

- Sample collection
  - Select representative samples
    - Send unopened containers if available
  - Proper handling (ASEPTIC technique)
    - Don’t contaminate the sample with your hands or the utensils and containers you collect it with (use sterilized utensils/containers to collect foods)
- Sample preparation
  - Chilled vs frozen
    - General rule: If it’s a refrigerated product, send it in refrigerated
  - Proper packing and shipment
    - Styrofoam coolers, ice packs to keep it cold

Using the DoD Veterinary Laboratory

- Sample submission
  - Use DD Form 1222
    - Fill out as much information as possible on the form
    - For foodborne illness outbreaks, put as much info about the outbreak as possible
    - For other submissions, describe as much as you can about the problem with the product and why you're submitting it
  - ALWAYS call the lab before sending in samples!!--Why is this important?
    - Phone # is in sample submission guide

Recommendations Based on Analysis

- If food safety concern identified
  - Product on medical hold
  - If a product from a food processing plant, notify appropriate regulatory authority
    - USDA for Meat & Poultry products
    - FDA for other foods
  - May lead to a product recall
- If food quality problem identified
  - Work with receiving activities and vendors to correct problem
  - Work with local managers to correct problem if it originated during storage on base

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